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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,944	10/02/2003	Doron Shaked	200205522-1	5923

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HEWLETT PACKARD COMPANY  
P O BOX 272400, 3404 E. HARMONY ROAD  
INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER
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SMITH, JEFFREY S

ART UNIT	PAPER NUMBER
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2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/675,944

Applicant(s)

SHAKED, DORON

Examiner

Jeffrey S. Smith

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 February 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12, 14-20 and 22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22 is/are allowed.
- 6) ☒ Claim(s) 1-3 and 14-15 is/are rejected.
- 7) ☒ Claim(s) 4-12 and 16-20 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Requirement for Information***

Applicant and the assignee of this application are required under 37 CFR 1.105 to provide the following information that the examiner has determined is reasonably necessary to the examination of this application.

In response to this requirement, please state whether any search of prior art was performed. If a search was performed, please state the citation for each prior art collection searched. If any art retrieved from the search was considered material to demonstrating the knowledge of a person having ordinary skill in the art to the disclosed Retinex method, please provide the citation for each piece of art considered and a copy of the art.

For example, if the results of a prior art search were used in a rejection of any claims pending in a corresponding foreign patent application, please submit a copy of the foreign rejection.

This requirement is an attachment of the enclosed Office action. A complete reply to the enclosed Office action must include a complete reply to this requirement. The time period for reply to this requirement coincides with the time period for reply to the enclosed Office action.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the

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method steps of claims 14-20 and 22 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

Claims 4-5, 16-17 are objected to because of the following informalities.

In claim 4, "the interpolated difference" lacks antecedent basis.

In claim 5, "to average the illumination-interpolated and the difference interpolated illuminations" should be "to average the illumination-interpolated

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illumination estimation and the difference-interpolated illumination estimation" to have antecedent support.

In claim 16, "producing the illumination estimation" is listed as an element of up-sampling the interim illumination estimations, yet in claim 14, "generating an illumination estimation" is performed "by up-sampling the interim illumination estimations." Therefore, claim 16 "generates an illumination estimation by up-sampling the interim illumination estimations, wherein up-sampling the interim illumination estimations further comprises...producing the illumination estimation." In other words, the illumination estimation is generated by producing the illumination estimation. This step is unclear.

In claim 16, "adding the illumination estimation and the input image" is performed by up-sampling the interim illumination estimations, but in claim 14, a Retinex-corrected output is produced by "combining the illumination estimation and the input image," which occurs after the up-sampling. Claim 16 is unclear.

In claim 17, "applying a difference interpolation algorithm" should be "implementing a difference interpolation module" and "applying an illumination interpolation algorithm" should be "implementing an illumination interpolation module." Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to

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be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,941,028 issued to Kimmel et al. ("Kimmel") in view of admitted prior art.

For claims 1 and 14, Kimmel discloses "a non-linear illumination estimation module that receives the sub-sampled images and produces corresponding interim illumination estimations." (See Column 3 lines 14-40).

Kimmel does not explicitly disclose a down-sampling module, an up-sampling module, and an illumination manipulation module.

Figure 2 of the admitted prior art discloses a down-sampling module, an up-sampling module and an illumination manipulation module. (See page 2 of the specification, in a "prior art Retinex-type algorithm, the illumination L is obtained from a sub-sampled version of the input image"). Figure 2 also shows an up-sampling module. (See page 3, "an up-sample module 34" produces "an estimation of the illumination ... using interpolation") and an illumination manipulation module 180.

It would have been obvious to one of ordinary skill in the art at the time of invention to use the down-sampling, up-sampling and illumination manipulation modules of the admitted prior art with the non-linear retinex algorithm of Kimmel in order to speed up the computationally intensive retinex process, as taught in the admitted prior art on page 3 of the specification.

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For claim 2, the admitted prior art discloses that the up-sampling module is configured to implement an interpolation routine. (See page 3 of the specification).

For claims 3 and 15, Kimmel discloses an illumination estimation that comprises local maximum routine. (See Kimmel at column 2 line 20 and column 12 line 25).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent Number 5,406,334 issued to Kondo et al. discloses an interpolation difference module used in dynamic range compression as shown in figure 6.

U.S. Patent Number 6,987,544 issued to Ogata et al. discloses a difference unit for determining a difference between an intermediate image and a smooth image in a Retinex method as shown in figure 7.

U.S. Patent Number 6,347,156 issued to Kamada et al. discloses a difference interpolating method in figure 15.

### ***Allowable Subject Matter***

Claim 22 is allowed.

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Claims 4-12 and 16-20 would be allowable if rewritten to include all of the limitations of the base claim and any intervening claims.

The art of record does not disclose "a difference interpolation algorithm...receiving the difference of the sub-sampled images and the interim illumination estimations, and a sampling rate and producing the interpolated difference; and an adder that adds the interpolated difference and the input image" as recited in claim 4. Similarly, claims 5-13 and 16-22 each contain a combination of a difference interpolation algorithm and an illumination interpolation algorithm which is not disclosed in the art of record.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey S. Smith whose telephone number is 571 270-1235. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on 571 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JSS

March 9, 2007



JINGGE WU  
SUPERVISORY PATENT EXAMINER